China Classification Society (CCS)

Witness Report

of Shipboard Testing for Seascape®-250-BWMS

China Classification Society (CCS) has received the type approval application for Seascape® ballast water management system (Type: Seascape®-250-BWMS) from Elite Marine Ballast Water Treatment System Corp.on behalf of the competent authority of PRC government. We intend to assess the documents requested for the shipboard testing and witness the complete five test cycles and sampling process. And also confirm the validation of the shipboard testing.

1. Documents

Before the start of shipboard testing, CCS had received the relevant documents submitted by Elite Marine Ballast Water Treatment System Corp. according to the requirements in 1.5, 2.1 and 2.2.2 annex of G8 guideline. It includes but not limited to the following contents:

1.1 Quality Management Plan for shipboard test (QMP)

1.2 Quality Assurance Project Plan for shipboard test (QAPP)

1.3 Standard Operational procedure for shipboard testing (SOP)

1.4 Seascape®-250-BWMS System Description

1.5 Seascape®-250-BWMS Q&M Manual

After the assessment, these documents comply with the G8 guideline with abundant contents. And the condition for shipboard testing is satisfied.

2. Drawings of the shipboard Testing

Before the start of shipboard test, CCS had received the relevant drawings and descriptive documents such as the P&ID, General layout and Q&M manual with abundant contents submitted by Elite Marine Ballast Water Treatment System Corp. according to the requirements in 1.5 annex of G8 guideline.

2.1 Seascape®-250-BWMS P&ID

2.2 Seascape®-250-BWMS Site Layout

2.3 Seascape®-250-BWMS System Layout

3. Site witness of Shipboard Testing

2 members from the CCS visited Ship KAISHENG 166 docked at Qinhuangdao port for site witness and evaluation of Seascape®-250-BWMS system arrangement and installation on board. We confirmed that it was complied with the description in QAPP and test plan.

The discharge of the experiment was permitted by the local environmental agency.

4. Witness the Facilities of the Shipboard Testing

In January 2013, the subject vessel for shipboard testing was investigated, the result of which is they all complying with the description in QAPP and test plan.

4.1 The ballast water treatment system to be tested is 250m^3/hr in rated capacity, which is in compliance with the scaling requirements stated in 2.3.13 annex in G8 guideline; Its rated capacity fits the ballast pump on KAISHENG 166 of which the related capacity is 680m^3/hr. It's confirmed that the rated capacity of ballast water treatment system to be tested is acceptable and valid.

4.2 NO.5 tanks (2 tanks) of the vessel were selected as test tanks (606m^3x2 in volume) complying with test requirements.

4.3 NO.2 tanks (2 tanks) of the vessel were selected as control tanks(625m^3x2 in volume) complying with test requirements.

4.4 The installation of the subject equipment complies with the requirements of 2.3.9 annex in G8 guideline and relative drawing. The commissioning of the system is finished before the test by qualified operator.

4.5 The area for sampling analysis onboard is about 25m^2. The analyzer equipment is well prepared according to experiment plan.

4.6 Safety measures are made in the test field.

4.7 Sampling points and sampling device is prepared as the requirement of 2.3.12 annex in G8 guideline.

4.8 Cleaning facilities are well prepared complying with the description in QAPP.

5. Test Party:

The First Institute of Oceanography, SOA is responsible for the sampling and

sample analysis task of the shipboard testing. The institute and its sampling and analysis personnel are qualified. The measures of control assurance and resources are sufficient for the testing.

6. Time of the Shipboard Testing

The shipboard testing lasted from April 2, 2013 to October 22, 2013.

7. Witness the Test Cycles of the Shipboard Testing

We have witnessed the whole process of the five test cycles in the shipboard test including ballasting /de-ballasting, sampling and sample analysis etc.

7.1 The shipboard test of Seascape®-250-BWMS indeed has four valid test cycles lasting six months in compliance with the requirements in 2.2.2.4 annex of G8 guideline.

7.2 Biological densities of the test water for valid test cycles are confirmed to comply with 2.2.2.6 and 2.2.2.9 annex in G8 as well as the description in QAPP.

7.3 Sampling point, sampling duration, sampling items and sampling quantity at ballasting and de-ballasting of the four valid test cycles are confirmed to comply with 2.2.2.6 annex in G8 as well as the description in QAPP.

7.4 Sample labeling during the four valid test cycles is valid and in compliance with the description in QAPP.

7.5 The field inspecting and monitoring of the operation parameters in four test cycles is confirmed to comply with the 2.2.2.10 annex of G8 guideline and the description in QAPP. Sampling record and system operation parameter record are valid and in compliance with the description in QAPP.

7.6 Sample analyzing and equipment operation is confirmed valid and complying with the description in QAPP.

7.7 The storage, handling and analysis of the sample is confirmed to comply with 2.3.34 annex in G8 guideline and the description in QAPP.

7.8 The sample is confirmed to be treated within the time prescribed.

8. Shipboard Test Report

Formal shipboard testing report and records were received by CCS after the completion of the shipboard testing. After the review, the report describes the

testing process and results in a clear way with completed original records and accurate analytical results. It is valid and complying with the requirements of G8 guideline.

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